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UNITED STATES DEPARTMENT OF AGRICULTURE
Rural Electrification Administration
Technical Standards Committees
(Electric)

Supplement No. 3, April 1981, to
REA Bulletin 43-5

LIST OF MATERIALS ACCEPTABLE FOR USE ON
SYSTEMS OF REA ELECTRIFICATION BORROWERS

The attached pages for the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers" are those which have been revised by action of the Technical Standards Committees during the months of January through March 1981. The following changes should be made in order to keep it up to date. Pages with a colon between are on the same sheet, both being changed.

<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>	<u>Add</u> <u>New Page</u>	<u>Remove</u> <u>Page</u>
a(1)	a(1)	gy-1:gy-2	gy-1:gy-2
k(3)	k(3)	gz-2	gz-2
l-3:l(1)	l-3:l(1)	sb-3	sb-3
m-1:m-2	m-1:m-2	sd	sd
p-1:p-2	p-1:p-2	U ae	U ae
p-7	p-7	U ae(1)	U ae(1)
p-10	p-10	U ax	U ax
u-2	u-2	U cg:U fw	U cg:U fw
u-3	u-3	U fz-1	U fz-1
af-1	af-1	U gn(4):U go	U gn(4):U go
ai-1:ai-2	ai-1:ai-2	U gp	U gp
ai-3	ai-3	U gu(2)	U gu(2)
an-1.3	an-1.3	U hb(1)	U hb(1)
an(2.1)	an(2.1)	U hp(1)	U hp(1)
an(3.2)	an(3.2)	U hy(1)	U hy(1)
bv	bv	GP-6	GP-6
cg-1	cg-1		
cg-3:cg-4	cg-3:cg-4		
cx	cx		
cz	cz		
du	du		
ea-1	ea-1		
ea-2:ea(1)	ea-2:ea(1)		
ei	ei		
es	es		
fd	fd		
fj, fk, fl:fm	fj, fk, fl:fm		
gw-1	gw-1		
gx-1	gx-1		
gx-2:gx-3	gx-2:gx-3		

a - Insulators, pin type
(Radio-freed)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*McGraw-Edison	1205	To obtain experience.
NP2T8	2/5/81	
24.9/14.4 kV		
ANSI Class 56-1		

*Does not have metal thimble.

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Forms 803 and 804 at the option of the owner.

k - Insulator, Suspension

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Sediver</u>		
10" suspension insulator	997(7/27/72)	To obtain experience.
N-6R2 (ball & socket, 15,000 lbs.)	1068(6/26/75)	
CT-12R2 (clevis, 25,000 lbs.)	1186(5/8/80)	Same as above
N-12R2 (ball & socket, 25,000 lbs.)	1175(11/2/79)	

Conditional List
k(3)
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k - Insulator, Distribution Deadend

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Chance</u>		
Distribution deadend	965	For the purpose of gaining operating experience as follows:
Catalog No. C654-0000	4/22/71	
"Epoxilator II"		
(15 kV line-to-line)		1. For distribution lines only.
Catalog No. C654-2500	1082	
"Epoxilator II"	1/22/76	
(25 kV line-to-line)	1129	2. To be used only in a horizontal position on deadends. Not to be used as vertical suspension insulators.
	12/15/77	
		3. Recommended maximum working load is 5,000 lbs.
		4. Not recommended for use in areas subject to contamination.
<u>Joslyn</u>		
Distribution deadend	1074	For the purpose of gaining operating experience as follows:
UDI 671-3002	9/25/75	
	1088	
	4/15/76	1. For distribution lines only, up to 15 kV line-to-line voltage.
Distribution deadend	1074	For the purpose of gaining operating experience as follows:
UDI 671-3010	9/25/75	
	1088	
	4/15/76	1. For distribution lines only, up to 25 kV line-to-line voltage.
<u>Plastigage</u>		
Distribution deadend	1158	To obtain experience.
H-15 kV-4	3/1/79	
H-25 kV-6	1208	
	3/19/81	

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1 - Deadend for steel strand (overhead ground wire)

TRANSMISSION

For high strength steel strand and aluminum-clad steel strand

<u>Manufacturer</u>	<u>Compression Type</u>				
	<u>High strength steel</u>		<u>Aluminum-clad steel</u>		
	<u>3/8"</u>	<u>7/16"</u>	<u>7 No. 9 AWG</u>	<u>7 No. 8 AWG</u>	<u>7 No. 7 AWG</u>
Fargo (Alcan)	82S712	82S714	82A79	82A78	82A77
ALCOA	4620.12	4627.14			
Burndy	YTW375E	YTW438E	YTW7M9T	YTW7M8T	YTW7M7T
Somerset	Order by wire size and type.				

<u>Formed Type</u>				
Chance			16M AWSBG	20M AWSBG
Helical Line Prod.		HG523-12.5M	HG525-16M	HG528-20M
Preformed Line Products		AWDE-4119	AWDE-4122	AWDE-4125

<u>Automatic Type</u>					
Fargo	GDE-302	GDE-303	GDE-302	GDE-302	GDE-303
Reliable	5202	5203	5202	5202	5203

Conditional List

1(1)
April 1981

1 - Clamp, deadend

DISTRIBUTION

2-Bolt Straight Line, Aluminum Alloy

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>*Barron Bethea</u>		
Aluminum alloy deadend	871	(a) To obtain experience.
Catalog No. SDF-10A	7/6/67	(b) Applications limited
(4 through 4/0 ACSR)		to replacements under
		hot line conditions.
<u>*Fargo</u>		
Aluminum alloy deadend	1137	Same as above.
Catalog No. GD-960A	4/20/78	
(With side opening	1144	
keeper order GD-961A)	8/3/78	
(No. 4 and No. 2 ACSR)	791	
Catalog No. GD-972A	4/30/64	
(2/0, 3/0, 4/0 ACSR)		
<u>*C & R Products</u>		
Aluminum alloy deadend	918	Same as above.
Catalog No. CR-15-180	5/15/69	
(No. 2 and No. 4 ACSR)		
<u>*Bethea/National</u>		
Aluminum alloy deadend	961	Same as above.
Catalog No. ASO-684-2	2/18/71	
(1/0, 2/0, 3/0 ACSR)		
Catalog No. ASD-2-N	1201	Same as above.
(4-2/0 ACSR)	12/4/80	
Catalog No. ASD-34-N		
(3/0, 4/0 ACSR)		
<u>*Anderson/Square D</u>		
Aluminum alloy deadend	1130	Same as above.
Catalog No. ADS-48-N	1/5/78	
(2/0 ACSR)		
Catalog No. ADS-60-N	1148	
(3/0 ACSR)	9/28/78	

*Straight line deadend clamps are applicable for urban construction where tensions are moderate and on lines often worked hot.

m - Clamp, suspension

2 BOLT - DISTRIBUTION

	<u>Copper & CWC</u>	<u>ACSR with 4</u>	<u>Straight or 2</u>	<u>Formed 1/0 & 2/0</u>	<u>Armor Rods* 3/0 & 4/0</u>
Anderson/Square D	MS-46-N	MS-60-N	MS-70-N	HAS-85-N	HAS-104-N
Barron Bethea	FWG-1	FWG-2	FWG-3	FWG-4	-
Bethea/National	FS-46-N	GW-1-N	LS-O-N	LS-1-N	LS-2-N
C & R Products	-	-	-	CRSC-1	CRSC-2
Dulmison	-	-	-	-	AGS*
Gould-Brown Boveri (ITE)	6240	6241	6242	6243	6244
Joslyn (Brewer-Titchener)	6240	6241	6242	6243	6244
Knox	6240A-U	6241A-U	6242A-U	6243A-U	6244A-U
Lapp	305740N	306027N	306028N	306029N	306030N
Ohio Brass	83044	83064	83074	83084	83104
Preformed	-	-	-	-	AGS*

*Accepted for larger sizes.

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m - Clamp, Suspension

ANGLE - DISTRIBUTION
No. 2 & 4 ACSR
Plus Rods

2-BOLT TRANSMISSION
For 3/8" Steel Overhead
Ground Wire

AAC-68-90	Anderson/Square D	MS-46-N
-	Barron Bethea	FGW-1
RALS-1	Bethea/National	FS-46-N
AC-75	Continental	FSC-46N
GD-907A	Fargo	-
2300	Gould-Brown Boveri (ITE)	6240
2300	Joslyn (Brewer-Titchener)	6240
2300	Knox	6240A-U
306092	Lapp	305740N
82860	Ohio Brass	83044
AC-1660	Power Line Hardware	

p - Connectors

Applicable Specification: "REA Specification for Connectors," DT-8

ACSR to ACSR
To same size or smaller

	Bare Conductor			
	4/0 - 2/0	1/0	2	4
ALCOA	190	396.6	490.0	490.0
Anderson/Sq. D	LC-53A	LC-51C	LC-51A	LC-51A
Bethea/National	APG-3	APG-2	APG-1	APG-1
Blackburn	PAE 4141-9	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	KVS28A	UCG25R	UC25R2R	UC25R2R
Fargo	GA-614	GA-620	GA-620	GA-620
Joslyn	6053	6052	6052	6052
Penn-Union	PCAA-20BF	PCAA-15BF	PCAA-10BF	PCAA-10BF
Reliable	6053	6052	6052	6052
Weaver	NICA12	NICA60	NICA2	NICA2

p - Connectors
ACSR to ACSR
To same size or smaller

	<u>Over Armor Rods</u>				
	<u>3/0</u>	<u>2/0</u>	<u>1/0</u>	<u>2</u>	<u>4</u>
ALCOA	200	R196	R196	R196	198
Anderson/Sq. D	LC-83A	LC-52C	LC-52C	LC-52C	LC-52C
Blackburn	-	-	PAA10	PAA10	PAA10
Burndy	-	-	UC32R	UC32R	UC32R
Fargo	GA-9843	GA-9842	GA-616	GA-616	GA-616
Joslyn	-	-	744AL	600AL	600AL
Penn-Union	-	-	ARC-12	ARC-11	ARC-14
Reliable	-	-	744AL	600AL	600AL
Weaver	-	-	NICR60	NICR60	NICR60

	<u>ACSR to Guy Strand</u>		
	<u>2/0</u>	<u>1/0</u>	<u>2 & 4</u>
ALCOA	396.6	396.6	490.0
Anderson/Sq. D	LC-52A-GP	LC-51C-GP	LC-51A-GP
Bethea/National	APG-3	APG-2	APG-2
Blackburn	PAE 2121-9	PAE 2121-9	PAE 2121-9
Burndy	UC28R	UCG25R	UCG25R
Dossert	AC103-LW	AC101-LW	AC100-LW
Fargo	GA-616	GA-620	GA-620
Joslyn	744AL	555AL	438AL
Penn-Union	ALC-15	ALC-10	PCA-010
Reliable	744AL	555AL	438AL
Weaver	NICR60	NICA60	NICA60

p - Connectors, Service

Aluminum-to-Aluminum

Solid or Stranded

	<u>No. 2</u>	<u>No. 4</u>
ALCOA	490.0	490.0
Anderson/Sq. D.	LC-51A	LC-51A
Bethea/National	APG-1	APG-1
Blackburn	PAE 2121-9	PAE ¹² 2121-9
Burndy	UC25R2R	UC25R2R
Fargo	GA-620	GA-620
Joslyn	AL24KK	AL46KK
Penn-Union	PCAA-10BF	PCAA-10BF
Reliable	AL24KK	AL46KK
Weaver	NICA2	NICA2

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p - Connectors, Service

Aluminum-to-Copper

Solid or Stranded

	<u>2 Al to 4 Cu</u>	<u>4 Al to 6 Cu</u>
ALCOA	R193	195
Anderson/Sq. D	LC-511A	LC-511A
Blackburn	PAC345	PAC345
Fargo	GA-620C	GA-620C
Joslyn	AL24UU	AL46UU
Reliable	AL24UU	AL46UU

p - Connectors, Service

Copper-to-Copper

Solid or Stranded

<u>Manufacturer</u>	<u>No. 4</u>	<u>No. 6</u>
Anderson/Sq. D	4E	6ES
Blackburn, ITT	4N	6N
Burndy	KP4C	KP6C
Dante	SE-3	SE-2
Dossert	ES-4	ES-6
Fargo	GC-5004	GC-5006
Ilsco	SX-4	SX-6
Joslyn	R46	R68
Kearney	118118	118117
Krueger & Hudepohl	397A	397A
Penn-Union	SX4	SX6
Reliable	R-46	R-68
Sherman	-	SC6X
Weaver	4SE	6SE

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p - Connectors, Compression

DISTRIBUTION

	<u>Aluminum to aluminum</u>	<u>Aluminum to copper</u>	<u>Copper to copper</u>	<u>Tap connections (Al to Al, Al to Cu)</u>
Anderson/Sq. D	AC Series	AC Series	VCUC	VCP
ITT Blackburn	Type WR	Type WR	Type CF	Type WR
Burndy	"Hycrimp"	"Hycrimp"	"Crimpit" (Type YC-C)	"Cabelok Crimpit" (Type YP-U)
Electrical Specialty	"Squeeze Conn" (Type S)	"Squeeze Conn" (Type S)	-	-
Kearney	"Squeezon" (Aluminum)	"Squeezon" (Aluminum)	"Squeezon" (Copper)	"Squeezon" (Aluminum)
Penn-Union	"Press-On" (Aluminum)	"Press-On" (Aluminum)	"Press-On" (Copper)	"Penn-L-Tap"
Somerset/Homac	H Tap-OB&DB	H Tap-OB&DB	-	H Tap-OB&DB

u - Deadend for galvanized steel or
alumoweld guy strand

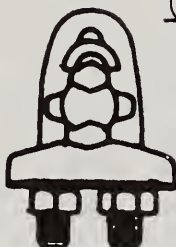


3-Bolt Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)*
Chance	6450	6461
Dixie	D6450	D6461
Joslyn	J930	J931
Kortick	K4124	K4005
McGraw-Edison	DG3C2	DG3C3
Util. Service	5273	5275

U-Bolt Guy Clamp

	Light (3/8" bolts)	Heavy (1/2" bolts)
Barron Bethea	GCU-38C	-
Continental	GC-64C	GC-67C
Flagg (MIF)	PAX-64C	PAX-67C



Offset Guy Clamp

	Light (1/2" bolts)	Heavy (5/8" bolts)
Chance	6409	6410
Joslyn	J926	J927
McGraw-Edison	DG5C1	DG5C2

*For use on transmission.

u - Deadend for galvanized steel guy strand

Strand Size:	1/4"	9/32"	5/16"	3/8"	7/16"
<u>Fargo</u>					
Bail for thimble eye	GDE-300	GDE-301	GDE-301	GDE-302	GDE-303
<u>Reliable</u>					
Bail for thimble eye	5100	5201	5201	5102	5103
Bail for guy insulator	5150	5251	5251	5152	5153



Formed Type

<u>Chance</u>					
For standard guy	1/4 GSBG	9/32 GSBG	5/16 GSBG	3/8 GSBG	7/16 GSBG
For wrapped guy	1/4 GSC	-	-	3/8 GSC	7/16 GSC
<u>Helical Line Products</u>					
For standard guy	HG-207-1/4"	-	-	HG-210-3/8"	HG-211-7/16"
<u>Preformed Line Products</u>					
For standard guy	GDE-1104	-	-	GDE-1107	GDE-1108
For wrapped guy	WGL-2100	-	-	WGL-2103	WGL-2104



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u - Deadend for alumoweld guy strand

Strand Size	7#12(6M)	7#11(8M)	7#10(10M)	7#9(12.5M)
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Formed Type
Alumoweld Guy Strand

Chance

For standard guy	6M-AWSBG	8M-AWSBG	10M-AWSBG	12.5M-AWSBG
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Helical Line Prod.

For standard guy	HG517-6M	HG519-8M	HG521-10M	HG523-12.5M
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Preformed Line Prod.

For standard guy	AWDE-4110	AWDE-4113	AWDE-4116	AWDE-4119
For wrapped guy	WGL-4110	WGL-4113	WGL-4116	WGL-4120

Automatic
Alumoweld Guy Strand

Fargo	GDE-300	GDE-301	GDE-301	GDE-302
Reliable	5200	5201	5201	5202

v - Guy attachment
for 5/8" bolt

<u>Type:</u>	<u>Formed Strap</u>	<u>Angle Bolt Eye</u>	<u>Guy Hook</u>	<u>Pole Eye Plate</u>
<u>Maximum Working Load Rating</u>	23,130 N (5200 lbs.)	23, 130 N (5200 lbs.)	23,130 N (5200 lbs.)	37,800 N (8500 lbs.)
Anderson Elec./ Square D	-	-	-	GSP-05
Barron Bethea	-	-	GH-5*	-
Bethea/National	-	-	AG-5*	PE5-6A
Chance	5004	0100	C203-0168*	-
Continental Elec.	-	-	GA-54*	PEP-66-45
Dixie	D5004	D0100	DD-9460, DD9462*	-
Flagg (MIF)	-	-	PL35A, PL57X*	PX88
Joslyn	J25164	J6500	J6555, J6556	-
Kortick	K4035, K4047	K3140	-	-
Lapp (Line Ware)	-	-	304014*	304021
McGraw-Edison	DG6H1	DG11E1	DG21H1 DG21H2	-
Power Line Hardware	-	-	GA-58C*	GA-548
Util. Service	31030	5531	-	-



*This hook may also be used in place of the wrapped guy arrangement in assemblies E3-2 and E3-3.

af - Cutouts, Distribution, Open

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>
Chance	C	15, 27 kV
General Electric	9F34	15, 27 kV
Joslyn	Series 2	15, 27 kV
Kearney	HX (with or without loadbreak accessory)	15, 27 kV
McGraw-Edison	SL	15, 27 kV
S & C Electric	XS	15, 27 kV
Southern States	Series 66 Series 70	15, 27 kV 15 kV
Westinghouse	NCX LBU-II	15, 27 kV 15, 27 kV

NOTE: The buyer should specify the load rating, voltage rating, interrupting rating and required accessories.

Cutouts used on underground riser poles should be load-break type or have hooks for portable load interrupters.

af-2
July 1980

af - Cutout, open-link fuse support

<u>Manufacturer</u>	<u>Mounting</u>	<u>7.2/12.5 kV 50 amp.</u>	<u>14.4/24.9 kV 50 amp.</u>
Joslyn	Crossarm	J9254-6	J9264-6
Kearney	Crossarm	6484-55	-
	Bushing	6486-4	-
McGraw-Edison	Crossarm	FT1A2	FT1A4
	Bushing	FT1OA3	-
RTE	Crossarm	41S3	41S6

NOTE: Items listed on this page are fuse supports only and have no inherent interrupting capacity. They should be used with fuse links capable of interrupting at least 1200 amperes and for transformer protection only.

ai - Rods, Ground

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Copper-covered steel rods

5/8"

Boggs	EB810
Calpico	CP588
Carolina Glavanizing	P-588
ITT Blackburn	6258
Joslyn	J8338
Kortick	K5428
Knight	858
Power Line Hardware	PLH-588-C
Utilities Service	6617
Weaver	W588
Wilcor	WA588C

Stainless Clad Steel

<u>Manufacturer</u>	<u>5/8"</u>	<u>3/4"</u>
Joslyn	J5374	J5377
Teledyne (MEFCO)	"PERMAGROUND"	"PERMAGROUND"

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April 1981

Applicable Size: The standard length is 8 feet and catalog numbers listed below are for this length. Longer rods may be required for special conditions.

Hot Dip Galvanized Steel

<u>Manufacturer</u>	<u>5/8"</u>	<u>3/4"</u>
Boggs	G588 PTG588**	G348 PTG348**
Carolina Galvanizing	G588 G-588PT**	G348 G-348PT**
Chance	8578 C203-0107**	8618 C203-0109**
Dixie	D8578	D8618
Galvan	GR6258	GR7508
General Electric	0982-00002	0982-00003
Grip-Tite	GT588 GT588PT**	GT348 GT348PT**
Joslyn	J3358B* J5328 J5228**	J3458B* J5338 J5238**
Knight	G-588 G-588PT**	G-348 G-348PT**
Kortick	K4658	K4678
Lloyd	6258H	7508H
McGraw-Edison	DN5S8 DN6D8*	DN6S8 DN7D8*
Porcelain Products	7338	7348
Power Line Hardware	PLH-588-G	PLH-348-G
Utilities Service	5307	6338
Weaver	8480G	8340G
Wilcor	WA8580G	-

Electro-Galvanized Steel

	<u>5/8"</u>	<u>3/4"</u>
Calpico	G8580	-
LMP	6258E**	7508E**

Stainless Steel

	<u>5/8"</u>	<u>3/4"</u>
Joslyn	23821	23822
Teledyne (MEFCO)	TDY Sol	TDY Sol
Wilcor	WA 588-S	WA 348-S

*Rod furnished with clamp.

**Rod furnished with 4 ft., No. 6 tinned or galvanized copper pigtail.

ai - Rods, ground, sectional

Galvanized steel and
copper-covered steel

Copper-covered ground rods are listed with a 13 mil minimum at any point and a 15 mil average covering of copper. All purchases should specify that a factory certification of the thickness of the copper must accompany the shipment of the rods.

Sectional Ground Rods

<u>Manufacturer</u>	<u>8' long</u>	<u>10' long</u>	<u>Couplings</u>	<u>Driving studs</u>
Blackburn	6258S	6260S	60C	60DS
Carolina Galv.	S-588	S-5810	CR58	DS58
Chance Galv. Steel	-	8512	8611	-
Joslyn Galv. Steel	J9158 J23282.8	J9160 J23282.10	J9182 J23282A	J9186 J9186
Knight	S858	S1058	SC58	DS58
Kortick	K5441	K5443	K5482	K5492
McGraw-Edison Galv. Steel	DN17S8	DN16S10	DN1K2	-
Power Line Hardware	PLH-588CS	PLH-5810CS	CBC-58	DS-58
UTM	-	-	910-030-05	-
Weaver	W-588T	W-5810T	158C	358D

aj
October 1980

aj - Clamp, Ground Rod

<u>Manufacturer</u>	<u>For 5/8"</u> <u>Copper-</u> <u>Covered Rod</u>	<u>For 3/4" Galv.</u> <u>or Stainless</u> <u>Steel Rod</u>	<u>For 5/8" Galv.</u> <u>or Stainless</u> <u>Steel Rod</u>
AMP	Copper AMPACT	-	-
	(Order by Description)	-	-
Anderson	GC-5	-	-
Blackburn	G5	-	-
Boggs	G31	-	-
Burndy	GKP635	-	-
C & R Products	CRGC-58	-	-
Copperweld	ABH58	-	-
Dossert	GNL62H	-	-
*Erico (Cadweld)			
1 ground wire	GR1-161G	GR1-181G	GR1-161G
2 ground wires	GR1-161G	GR1-181G	GR1-161G
Greaves/Mercury	G-580	-	-
IlSCO	GRC-58	-	-
Joslyn	J8392AB	R3459	R3459
Knight	C58	UCSS	UCSS
Krueger & Hudepohl	808	-	-
Kortick	K4647	-	-
O-Z Elec. Mfg.	BG0304	-	-
Penn-Union	CEB-2	-	-
Power Line Hardware	RC-58C	-	-
Reliable	E58	3459	3459
UTM	910-023-03	910-007-02	910-007-02
Weaver	WB5/8	-	-
Wilcor	HGR5/8	-	-

* Includes disposable molds.

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

	<u>7.2/12.5 & 7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
<u>General Electric</u>			
Conventional, single bushing	HS	HS	HS
Self-protected, single bushing	HSBA	HSBA	HSBA
Conventional, two bushing	HS	HS	HS

Type HS may also be obtained with internal fuse, with internal fuse and double gap, with bushing mounted cutout and double gap, and with bushing mounted cutout and arrester (Type HSCA).

<u>Howard Industries</u>			
Conventional, single bushing	REC-C	REC-C	REC-C
Conventional, two bushing	Conv-2B	Conv-2B	Conv-2B
Self-protected, single bushing	REC-P	REC-P	REC-P

<u>Kuhlman</u>			
Conventional, single bushing	I	I	I
Conventional, two bushing	B	B	B
Self-protected, single bushing	H	H	H

Type I may also be purchased with internal fuse, with internal fuse and double gap (Type G), and with bushing mounted cutout and lightning arrester (Type J).

<u>Magnetic Electric</u>			
Conventional, single bushing	AOD	AOD	
Conventional, two bushing	AOD	AOD	
Self-protected, single bushing	AOD	AOD	

<u>McGraw-Edison</u>			
Conventional, single bushing	G	G	GD
Self-protected, single bushing (with open-gap valve arrester)	L	L	LD
Conventional, two bushing	E	E	ED

Type G may also be obtained with internal fuse, with internal fuse and double gap, and with bushing mounted cutout and lightning arrester.

an-1.3
April 1981

an - Transformers, distribution, pole type
Primary Voltages 7.2/12.5, 7.62/13.2 and 14.4/24.9 kV

<u>7.2/12.5 & 7.62/13.2</u>	<u>14.4/24.9</u>	<u>Dual Voltage</u>
-------------------------------------	------------------	-------------------------

NECO

Conventional, single bushing	NC	NCH
Self-protected, single bushing	NC-1	NCHCB

Type NC may also be obtained with double gap and internal fuse (NC-2) and with arrester and open link fuse (NC-3).

H. K. Porter (Delta-Star)

Conventional, single bushing	OS-B3	OS-B3	OS-B3
Self-protected, single bushing	OSP-B3	OSP-B3	OSP-B3
Conventional, two bushing	OS-A	OS-A	OS-A

Types OS-B3 and OS-A may also be obtained with internal fuse.

RTE

Conventional, single bushing	REA-Conv	REA-Conv	REA-Conv
Self-protected, single bushing	REA-CSP	REA-CSP	REA-CSP
Conventional, two bushing	REA-Conv	REA-Conv	REA-Conv

Conventional single bushing type may also be purchased with external overload protection and double gap and with bushing mounted cutout and lightning arrester.

Rural Electric Supply Cooperative

Conventional, single bushing	CONV
Conventional, two bushing	CONV
Self-protected, single bushing	CSP

The single bushing transformer may also be obtained with double gap and internal fuse (Type DG) or lightning arrester and external cutout (Type COLA).

Dead-front for use in enclosure:

Add "R" (Radial) or "LF" (Loop Feed) to designation

an - Transformers, Distribution, pole type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Tarrant</u> 7.2/12.5 kV and 7.62/13.2 kV	791 4/30/64	To obtain experience.
Conventional, single bushing Type CB-1		
Conventional, two bushing Type CB-2		
Self-protected, single bushing Type SG-1		
May also be obtained with lightning arrester and internal fuse. Types PSG-1 and PSG-2.		
<u>VanTran</u> 14.4/24.9 kV and Dual Voltage	1075 10/16/75	To obtain experience.
Conventional, single bushing Type CR	1095	
Conventional, two bushing Type CD	8/11/76	
Self-protected, single bushing Type CSP-R		

Condition of Acceptance: To obtain experience.

Transformers with 115 kV and 138 kV primary voltage ratings are acceptable with full BIL and with one step reduced BIL.

"X" indicates that acceptable test data have been furnished REA for this rating and for secondary voltages in either 15 kV or 25 kV class.

"s" indicates that performance specifications have been furnished REA and test data are to be submitted when available.

Primary Voltage-kV	kVA Capacity											
167	250	333	500	833	1250	1667	2500	3333	5000	6667	8333	10,000

$$\frac{7.75}{34.4}$$

✕ ✕ ✕

Fed. Pacific

67.0

X

General Electric
43.8
115

5

5

Hevi-Duty
34.4
43.8
67.0

5

5

5

5

5

X

X

X

1

1

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA					MVA								
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30

Central Moloney
34.4

s

Federal Pacific
34.4
67.0
115
138

s	s	s												
X	s	s	X	X	X	X	X	X	X	X	X	X	X	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Federal Pacific
Type TC-546 load tap changers.

General Electric
34.4
43.8
67.0
115
138

s	s	s	s	s	s	s	s	s	s	s	s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using General Electric
Types LR72, LR65 and LRT-200 load tap changers.

an - Transformers, Power
Three-Phase, Step-Down
for Distribution Substation Use

Condition of Acceptance: To obtain experience.

Primary Voltage-kV	kVA						MVA							
	750	1000	1500	2000	2500	3750	5	7.5	10	12	15	20	25	30
Hevi-Duty														
34.4	S	S	X	S	X	X	X	X	S	S	X	S	S	S
43.8	S	S	S	S	S	X	X	X	X	X	X	S	S	S
67.0					X	X	X	X	X	X	X	X	S	S
115							X	X	X	X	X	S	S	S
138							S	S	X	S	S	S	S	S

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse Types UTS-A and UTT-B and Siemens-Allis Type TLS load tap changers.

Transformers 5 MVA and larger also accepted as load tap changing transformers using Westinghouse
Types UTS-A and UTT-B and Siemens-Allis Type TLS load tap changers.

McGraw-Edison																
34.4	s		s								s	s	s	s	s	s
43.8	s		s								s	s	s	s	s	s
67.0	s		s								s	s	s	s	s	s

Transformers 5 MVA and larger also accepted as load tap changing transformers using McGraw-Edison
Types 550, 550B and 550C load tap changers.

H. K. Porter																
(Delta-Star)																
34.4	s	s	s		s	X	X	X	s							
43.8			s	s	s	X	X	X	s	X						
67.0		s	X	s	X	X	X	X	X	X	X					
115							X	X	s	X	X					
138							s	s	s	s	s	s	s	s	s	X

Transformers 5 MVA and larger also accepted as load tap changing transformers using Siemens-Allis
Types TLS and TLH-21 load tap changers.

bu
July 1980

bu - Connector, grounding
for transformer or other equipment

<u>Manufacturer</u>	<u>Copper Alloy¹</u>	<u>Plated Copper Alloy²</u>	<u>Aluminum Alloy³</u>
Anderson/Square D	GTCL-23A	GTCL-23A-TP	
ITT Blackburn	TTC-4	TTC2P	
Burndy	EQC632C	EQC632C-TN	
Dossert	TGCL8-50	TGCL8-50-SN	
Fargo	GC-207	GC-207P	GA-220
Penn-Union		GSE-C1TN	
ITT Weaver	TGC-4	TGC-2P	

1 - For use with copper type ground wire.

2 - For use with both copper and aluminum type ground wire.

3 - For use with aluminum type ground wire.

bv
April 1981

bv, Rods, armor

Aluminum or aluminum alloy rods for use on ACSR

Blackburn	Formed Type
Dulmison	Formed Type
Helical Line Products	Formed Type
Preformed Line Products	Formed Type
Southwire	Straight

Copperweld rods for copper or CWC conductor

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Alumoweld rods for aluminum clad steel (Alumoweld)
overhead ground wire

Helical Line Products	Formed Type
Preformed Line Products	Formed Type

Bronze rods (10 inch length) for jumper protection

Preformed Line Products	Formed Type
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cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structure	Tilting Ins.		Vertical Break		Side Break		Center Break		Double Break	
		Type	kV	Type	kV	Type	kV	Type	kV	Type	kV
A. B. Chance	Horizontal Phase over Phase Vertical					D2,D3(L)15-34.5 D2,D3(L)15-34.5 D2,D3(L)15-34.5					
Gould-Brown Boveri (ITE)	Horizontal	3ST	15-34.5	TTR6	15-161						
Johnson	Horizontal			VIP	15-230	LS	15-69	M	15-230		
Joslyn (Hi-Voltage)	Horizontal Horizontal			RF-2(VL)	15-230	RB-1(VL)	15-25				
						RB-1*	15-115				
Kearney	Horizontal	NE-2	15-34.5	AR	60-P	15-69					
MEMCO	Horizontal Horizontal	AgF AgC	15-69 15-69	EA	15-345			EE	69-230		
H. K. Porter (Delta-Star)	Horizontal			MK-40	15-69	PMB-40A	15-69	LPC	69-230		
Siemens-Allis	Horizontal			TA(VL)	15-69	SSB-T	15-69	CCB	115-230		
								CBL-2	115-230		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

* These switches may be purchased with reduced voltage vacuum interrupters and may be applied for loop sectionalizing duty when peak recovery voltage does not exceed 25 kV.

NOTE: Vertical phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
NEMA standard switches for station and line structures

Manufacturer	Acceptable Mounting on Structures	Tilting Ins.		Vertical Break		Side Break		Center Break		Double Break	
		Type	kV	Type	kV	Type	kV	Type	kV	Type	kV
Powerdyne (Kearney)	Horizontal Phase over Phase							V2-V4	15-230		
								V2	15-23		
ANIXTER Royal	Phase over Phase Horizontal					RG-63(L)	15-69				
						RSL-L(L)	15-69				
S & C	Horizontal Phase over Phase Vertical			Alduti(L)	15-34.5	Alduti(L)	15-25			Alduti(L)	34.5-46
				Alduti(L)	15-25	Alduti(L)	15-25			Alduti(L)	34.5-46
				Alduti(L)	*15-34.5	Alduti(L)	15-25			Alduti(L)	*34.5-46
SEECO	Phase over Phase					GOABS(VL)	15-69				
Southern States	Horizontal										
				WAG	15-230	57K	15-69				
Turner	Phase over Phase Horizontal							(1D, 2D, 3D)	(VL) 15-161		
								1D(VL)	15-161		
USCO	Horizontal Horizontal Phase over Phase			AGT(VL)**	15-230	GSH-4(VL)	15-138	AGCH**	15-345		
								AGCH-V**	*34.5-230		
						GSH-4(VL)	15-138	GCH	15-23		

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

* These switches, except 34.5 kV Alduti vertical break, are available and accepted in combination with the S & C Type SMD substation fuse cutouts listed on page af-3.

** Also available in bronze in some ratings.

NOTE: Vertical phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

April 1981

cg - Switch, air, three-pole, group-operated

(Not Suitable for Substation Use)

<u>Manufacturer</u>	<u>Acceptable Mounting</u>	<u>Vertical Break</u>		<u>Side Break</u>		<u>Center Break</u>	
		<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>
Chance	Horizontal			D2, D3(L)	15-34.5		
	Phase-over-phase			D2, D3(L)	15-34.5		
	Vertical			D2, D3(L)	15-34.5		
K-P-F	Horizontal	SV-202	23	A202-A208	15-110		
	Phase-over-phase			A202	15-23		
	Phase-over-phase			W202	15-23		
	Phase-over-phase			MD202	15-23		
Powerdyne (Kearney)	Horizontal			S	15-23	V2	15-23
	Phase-over-phase			S	15-23	V2	15-23

(L) Means gas or solid material full-load interrupters are accepted and available.

(VL) Means vacuum full-load interrupters are accepted and available.

NOTE: Phase-over-phase mounted switches are not acceptable above 25 kV class unless equipped with full-load interrupters. Switches of 15 kV and 25 kV classes with individual phases mounted on wood crossarms or poles must be supplied with insulated interphase and control rods.

cg - Switch, air, three-pole, group-operated
(Factory Preassembled)

<u>Manufacturer</u>	<u>Acceptable Mounting on Structures</u>	<u>Vertical Break Type kV</u>	<u>Side Break Type kV</u>
Chance	Horizontal (A)		D4,D5(L)15-27
	Phase over		
	phase (A)		D4,D5(L)15-27
	Vertical (A)		D4,D5(L)15-27
	Horizontal (B)		D4,D5(L)34.5 (200 kV BIL)#
	Phase over		
	phase (B)		D4,D5(L)34.5 (200 kV BIL)#
	Vertical (B)		D4,D5(L)34.5 (200 kV BIL)#
S & C	Horizontal (A)		Alduti(L)15-25
	Phase over		
	phase (A)		Alduti(L) 25
	Vertical (A)		Alduti(L)15-25
	Phase over		
	phase(B)	Alduti (L) 34.5 (200 kV BIL)#	
	Vertical (B)	Alduti (L) 34.5 (200 kV BIL)#	

(L) Means gas or solid material full-load interrupters are accepted and available.

Accepted for transmission use only, provided the steel crossarm base is grounded with an adequate grounding connector.

(A) Not suitable for substation use.

(B) NEMA standard switches for station and line structures.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods, except as otherwise noted.

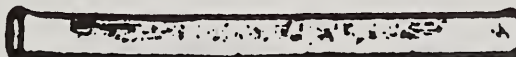
cx
April 1981

cx - Splice, oval tube

<u>Conductor Size:</u>	<u>4</u>	<u>2</u>	<u>ACSR</u>	<u>1/0</u>	<u>2/0</u>
------------------------	----------	----------	-------------	------------	------------

<u>Conductor Size:</u>	<u>0 x 7</u>	<u>2 x 3</u>	<u>Copper</u>	<u>4</u>	<u>6</u>
MEMCO	63	62		58	56
National Tel. Supply	464	463		459	457

<u>Conductor Size:</u>	<u>Copperweld-Copper</u>	<u>6A</u>	<u>8A</u>
MEMCO		170	168
National Tel. Supply		460	459



cy-1
January 1981

cy - Splice, Compression
ACSR

<u>Conductor Size</u>	<u>AMP</u>	<u>Alcoa</u>	<u>Anderson/ Sq. D</u>	<u>Burndy</u>
4 6/1		2-piece	VC-36R	"Unisplice"
4 7/1		Order	VC-36R	(1-piece)
2 6/1		by	VC-36R	or Y-S
2 7/1		Conductor	VC-36R	(2-piece)
1/0		Size	VC-50R	Order by
2/0		and	VC-50R	Conductor
3/0		Stranding	VC-61R	Size and
4/0		"	VC-61R	Stranding
266.8 kcmil 26/7		2-piece	VC-831-1-RM	2-pc.
336.4 kcmil 26/7		Compression	VC-831-1-RM	Type YTS
477 kcmil 26/7	Type SP	Alloy (Order	VC-832-2-RM	"
556.5 kcmil 26/7	(Order by	by Conductor	VC-833-3-RM	"
795 kcmil 26/7	Conductor Size	Size and	VC-835-4RM	"
954 kcmil 54/7	and Stranding)	Stranding)	VC-835-4RM	"

<u>Conductor Size</u>	<u>Fargo (Alcan)</u>	<u>ITT Blackburn</u>	<u>Kearney</u>
4 6/1		Type RC	OH4-61A
4 7/1		1-piece	OH4-71A
2 6/1		Order	OH2-61A
2 7/1		by	OH2-71A
1/0		Conductor	OH1/0-61A
2/0		Size	OHR2/0-61A
3/0		and	OHR3/0-61A
4/0		Stranding	HR4/0-61A
266.8 kcmil 26/7	TJA-1109	Type DT	HR-266-267A
336.4 kcmil 26/7	TJA-1309	2-piece	HR-336-267A
477 kcmil 26/7	TJA-1809	for	HR-477-267A
556.5 kcmil 26/7	TJA-2209	kcmil sizes	HR-556-267A
795 kcmil 26/7	TJA-3309		
954 kcmil 54/7	TJA-4121		

<u>Conductor Size</u>	<u>Nat. Tel. Supply</u>	<u>Somerset/ Homac</u>
4 6/1	"Nicopress"	"Tension
4 7/1	(1-pc. or 2-pc.)	splicer"
2 6/1	Order by Conduc-	(1-piece or
2 7/1	tor Size and	2-piece)
1/0	Stranding	Order by
2/0	2-pc.	Conductor
3/0	"	Size and
4/0	"	Stranding
266.8 kcmil 26/7	"	2-pc.
336.4 kcmil 26/7	"	"
477 kcmil 26/7	"	"
556.5 kcmil 26/7	"	"
795 kcmil 26/7		
954 kcmil 54/7		

cy - Splice, compression

1-piece splice for ACSR

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
*ALCOA "Jiffy Joint"	704 11/10/60	To obtain experience.

1-piece splice for AWAC

Burndy AWAC 4-4/3 YDS7M10T AWAC 2-4/3 YDS7M9T AWAC 1/0-4/3 YDS7M7T	1050 9/19/74	To obtain experience.
--------------------------------------------------------------------------------------	-----------------	-----------------------

*Satisfactory for use with 6201 and 5005 all aluminum alloy conductor through 4/0 and 19 strand conductors of sizes 26,800 CM and 477,000 CM.

cz - Splice for Steel Strand (Overhead Ground Wire)

Compression

Single Sleeve Only

	<u>High Strength Steel</u>		<u>Extra High Strength</u>		<u>Aluminum Clad Steel</u>		
	<u>3/8"</u>	<u>7/16"</u>	<u>3/8"</u>	<u>7/16"</u>	<u>7 No. 9 AWG</u>	<u>7 No. 8 AWG</u>	<u>7 No. 7 AWG</u>
Alcoa			4914.386	4916.453			
Burndy	YTS375E	YTS438E			YDS7M9T	YDS7M8T	YDS7M7T
Fargo (Alcan)	81390	81468	81390		81375	81421	81468

Kearney HR-3/8-3-7S

National Tel. Supply 5-7/120G92 5-7/145J22

Somerset/Homac 29714

Steel and Aluminum Sleeves

Somerset/Homac 29714 & 28414
(Two piece)

Automatic

Reliable 5002 5003

Bolted Type

Electroline GD-537

Formed Type

Helical
Produc HS-310-3/8" HS-311-7/16"

du
April 1981

du - Link, Extension

DISTRIBUTION

<u>Manufacturer</u>	<u>Catalog Number</u>
Chance	C207-0112
Continental	CEL-14
Flagg (MIF)	PA320
McGraw-Edison	DC33B6
Utilities Service	495

<u>Transmission</u>	
Continental	CEL-14
Gould Inc. (ITE)	3074A
Joslyn (Bolted) (High Strength)	J7712 J22609
Knox	3074A
McGraw-Edison	DC152B1

Guy Extension Link
(For "H" Structure)

<u>Manufacturer</u>	<u>One Guy Attachment</u>	<u>Two Guy Attachment</u>
Joslyn	J22421	J22523

NOTE: The distribution extension links may be substituted for anchor shackle (Item bo), eye bolt (Item o) and eye nut (Item aa) for both small and large conductor drawings shown in REA Forms 803 and 804 at the option of the owner.

HS-311-7/16"
HS-310-3/8"

Produced

Conditional List
du(1)
July 1980

du - Connecting Links

Strength Rating: 25,000 lbs. ultimate loading

<u>Manufacturer</u>	<u>Link to guy</u>	<u>Size</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
Hughes	3154 Link to <u>Insulators</u>	3/8" x 2" x 9-1/2"	1172 9/20/79	To obtain experience in conjunction
Hughes	3176	3/8" x 3" x 9-1/2"	1172 9/20/79	with pole bands (Item fv(1))

dz
July 1980

dz - Clip, Guy Wire

<u>Manufacturer</u>	<u>5/16"</u>	<u>3/8"</u>	<u>7/16"</u>	<u>1/2"</u>
Chance	6453	6454	6455	6456
Dixie	D6453	D6454	D6455	D6456
McGraw-Edison	DJ17C6	DJ17C8	DJ17C10	DJ17C12
Utilities Service	4953	4954	4955	4956

ea-1
April 1981

ea - Insulator, post type

DISTRIBUTION

System voltage, kV	7.2/12.5	7.2/12.5	14.4/24.9
Leakage, inches	7½	10	15
Flashover, dry, kV	65	70	95
Flashover, wet, kV	<u>40</u>	<u>50</u>	<u>65</u>

Chance

Insulator only - order
stud separately (Aluminum
base, also available with
malleable iron base)

C903-1900 C903-1901 C903-1902

Lapp

7" Stud
1-3/4" Stud

4415P 4420P 4427P
4315P 4320P 4327P

Ohio Brass

7" Stud
1-3/4" Stud

43400-3040 43401-3040
43400-3010 43401-3010

TRANSMISSION

System voltage, kV	22	34.5	46
EEI-NEMA Class	57-2	57-3	57-4
Flashover, dry, kV	110	125	150
Flashover, wet, kV	<u>85</u>	<u>100</u>	<u>125</u>

Chance

Insulator only - order
stud separately

C903-1002 C903-1003

Lapp

7" Stud
1-3/4" Stud

9435P 9445 P 9455 P
9335P 9345 P 9355 P

Ohio Brass

7" Stud
1-3/4" Stud

37620-3040 41640-3040 41650-3040
37620-3010 41640-3010 41650-3010

NOTE: Post insulators (Item ea) may be substituted for the crossarm pin (Item f) and pin insulator (Item a) for both small and large conductor distribution drawings shown in REA Forms 803 and 804 at the option of the owner.

ea - Insulators, horizontal post type

<u>Manufacturer</u>	<u>34.5 kV</u>	<u>69 kV</u>	<u>115 kV</u>
Gould-Brown Boveri (ITE)	62356	-	-
Lapp	F-4745	F-4788	F-70147
Ohio Brass	43740	43790	47043

Conditional List
ea(1)
April 1981

ea - Insulator, post type

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Gould-Brown Boveri (ITE)</u>		
2220 (7.2/12.5 kV)	932	To obtain experience
2227 (14.4/24.9 kV)	12/4/69	
62055 (22 kV)	1189	
62056 (34.5 kV)	6/19/80	

ei - Clamps, suspension with socket eye

ACSR with Straight or Formed Armor Rods

	AWG					kcmil				
	1/0 & 2/0	3/0	4/0	266.8	336.4	477	556.5	795	954	
	Iron or Steel Clamps									
Anderson	MS-82-S	-	MS-104-S	MS-104-S	-	-	-	-	-	-
Barron Bethea	FGW-4S	-	-	-	-	-	-	-	-	-
Bethea/National	FS-83-S	-	-	-	-	-	-	-	-	-
Gould-Brown Boveri(ITE)	6203	6204	6204	6205	6255	6257	-	-	-	-
Joslyn	6203	6204	6204	6205	6255	6257	-	-	-	-
(Brewer-Fitchener)										
Knox	6203A-U	6204A-U	6204A-U	6205A-U	6255A-U	6257A-U	-	-	-	-
Lapp	305743S	-	-	-	-	-	-	-	-	-
Ohio Brass	83085	83105	83105	83115	83125	83145	-	-	-	-

ACSR with Straight or Formed Armor Rods

	AWG					kcmil				
	1/0 & 2/0	3/0 & 4/0	266.8	336.4	477	556.5	795	954		
	Aluminum Alloy Clamp									
Anderson	HAS-85-S	HAS-104-S	HAS-104-S	HAS-118-S	HAS-139-S	HAS-147-S	HAS-182-S	HAS-182-S	HAS-182-S	
Bethea/National	LS-1-S	LS-2-S	LS-2-S	LS-3-S	LS-4-S	LS-5-S	LS-6-S	LS-6-S	LS-7-S	
C & R	CRSC-1S	CRSC-2S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	CRSC-3S	
Dulmison	-	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS	
Gould-Brown Boveri(ITE)	9503-U	9504-U	9504-U	9505-U	9506-U	9506-U	9506-U	9506-U	9506-U	
Joslyn	9503-S	9504-S	9504-S	9505-S	9506-S	9506-S	9506-S	9506-S	9506-S	
(Brewer-Fitchener)										
Knox	9503-U	9504-U	9504-U	9505-U	9506-U	9506-U	9506-U	9506-U	9506-U	
Lapp	306029S	306030S	306030S	306031S	306032S	306032S	306032S	306032S	306032S	
Ohio Brass	87085	87105	87105	87115	87135	87135	87135	87135	87135	
*Preformed	-	AGS	AGS	AGS	AGS	AGS	AGS	AGS	AGS	

*Clevvis type available.

ACSR

Iron or Steel Clamps (Require armor tape or liner)

Aluminum Alloy Clamps (Do not require armor tape or liner)

NOTE: When used with clevis-type insulators for large conductors on distribution lines, order clamp with clevis eye.

es - Splice Cover, Plastic

(For use over compression type service connections
in place of tape.)

<u>Manufacturer</u>	<u>Type</u>
Anderson/Square D	Type SEC
ITT Blackburn	Type C
Kearney	Type 601
3M	PST Series 8400
Plastic Engineering & Sales Co.	Wire Splice Cover
Virginia Plastics	Type VP

Splice Cover and Moisture Seal for
Secondary Cable Connections (See
Drawings G312 and UM5)

<u>Manufacturer</u>	<u>Type</u>
AMP	Sealing and Dielectric Compound
Bishop	Electro-Seal
3M	Scotch Brand #2200

Bolted Connector Cover

(For use over bolted type service connections in place of tape.)

<u>Manufacturer</u>	<u>Type</u>
Fargo	GA-9000 B Series

eu
July 1980

eu - Extension Link
(Fiberglass)
(Distribution)

<u>Manufacturer</u>	<u>Strength</u>	<u>Catalog No.</u>
Anderson/Square D	10,000 lbs. 15,000 lbs.	*GSB1-9 GSB2-12
Barron Bethea	11,000 lbs. 15,000 lbs.	*BB-11-EE-12 BB-15-EE-12
Continental	11,000 lbs. 15,000 lbs.	*GEE11-12 GEE15-12
Dixie	15,000 lbs.	GIG-15010-TT-R
Flagg (MIF)	11,000 lbs. 15,000 lbs.	*110-12EE 150-12EE
Joslyn-Empire	10,000 lbs. 15,000 lbs.	*400-12 EE 500-12 EE
Plastigage	11,000 lbs. 15,000 lbs.	*HSB-1-12 HSB-2X-12

*For use with 6" suspension insulators.

fc - Capacitors, shunt
24900/14400 volts

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>McGraw-Edison</u>		
All film type, 1 bushing	1109	To obtain experience
CEP138B4 (100 kvar)	3/3/77	
CEP137B4 (150 kvar)		
CEP142B4 (200 kvar)		
CEP162B4 (300 kvar)	1186 (5/8/80)	Same as above
<u>Sangamo</u>		
All-film type, 1 bushing	1200	Same as above
356365 (50 kvar)	11/20/80	
356016 (100 kvar)		
356115 (150 kvar)		
356676 (200 kvar)		
All-film type, 2 bushing		
356318 (50 kvar)		
356048 (100 kvar)		
356148 (150 kvar)		
356618 (200 kvar)		
<u>Westinghouse</u>		
Film type, 1 bushing	1116	Same as above
1N02050A31 (50 kvar)	6/9/77	
1N02100A31 (100 kvar)		
1N02150A31 (150 kvar)		
1N02200A31 (200 kvar)		
Film type, 3 bushing 3Ø		
1N02303A29 (300 kvar)		
1N02403A29 (400 kvar)		
<u>General Electric</u>		
Film/Foil Type, 1 bushing	1192	Same as above
51L252RC (50 kvar)	8/7/80	
54L252RC (100 kvar)		
54L552RC (150 kvar)		
58L154RC (200 kvar)		

fd
April 1981

fd - Hangers, capacitor

Crossarm Mounting

	<u>1 unit</u>	<u>2 units</u>	<u>3 or 4 units</u>
General Electric	39F41	39F53	39F54
McGraw-Edison	CH1A1	CH2A2	CH4A1
Sangamo	94346	94345	94347
Westinghouse	85B397G01	791C644G01	791C644G02

Pole Mounting

	<u>Single Phase</u>	<u>Three Phase</u>	
		<u>In Line</u>	<u>Cluster</u>
Aluma-Form	CR-3* thru CR-6*	CR-3/4*	3-CR-3/4*
Joslyn	J6744, J6744A		
General Electric	39F83G1	39F86G1	
Sangamo	97650		
Westinghouse	AL30R (3 units)	(1Ø units)	
	AL60R (6 units)	AL30R (3 units)	
		AL60R (6 units)	
		AL90R (9 units)	
		(3Ø units)	
		AL13W (1 unit)	
		AL23W (2 units)	
		AL33W (3 units)	
		AL43W (4 units)	
		AL53W (5 units)	

* Available with oil switch mounting bracket.

fj, fk, fl

April 1981

fj - Bracket, extension

(For use in mounting oil circuit reclosers or sectionalizers)
See Drawing VM3-10A

	<u>Through Bolt Type</u>	<u>Band Type</u>
Aluma-Form	TBRSM-1, TB2M1-6*	RSM-1
Dixie	D-2359-M	
Joslyn	J2357M	
McGraw-Edison	DR2E3	

*For mounting double lug reclosers.

fk - Bracket, oil circuit recloser or sectionalizer

(For cluster mounting of three oil circuit reclosers on pole)

Aluma-Form	RSM-3
*McGraw-Edison	DT8C1
Turner	695-3

*Suitable for 14.4 and heavy duty 7.2 kV.

fl - Rack, primary metering

(For cluster mounting of primary metering equipment on pole)

Aluma-Form	PMM Series
Turner	3CT-PT

fm
April 1981

fm - Bracket, Arrester and Pothead Extension

For Distribution Arrester and Cutout - Pole Mounting

<u>Manufacturer</u>		<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form		1HCA-18 Series	R3CA-48
Anderson/ Square D	12.5/7.2 kV 24.9/14.4 kV	COB-E-120-TGL COB-E-180-TGL	
Bethea/National	12.5/7.2 kV 24.9/14.4 kV	VIB3-12F-GC VIB3-18F-GC	
Chance		C653-1038	C653-1056
Continental	24.9/14.4 kV 12.5/7.2 kV	IACB-18-5LGE IACB-12-5LGE	
Dixie	12.5/7.2 kV	D-1580	
Flagg (MIF)	12.5/7.2 kV 24.9/14.4 kV	PA613H PA619H	
Lapp	12.5/7.2 kV 24.9/14.4 kV	304036-G 304038-G	
McGraw-Edison		DC34B3	
Power Line Hardware	12.5/7.2 kV	CA-12-3GL	
Shakespeare		892-18	670-40

For two distribution arresters in parallel or one
arrester and cutout - crossarm mounted

<u>Manufacturer</u>	<u>Catalog No.</u>
McGraw-Edison	DM23B2

For Intermediate Arrester Mounting

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three Phase</u>
Aluma-Form	WBMA-1	R3CSA-48

gj - Crossarm Assemblies and Arm Spacers

Distribution

Wood crossarm assembly complete with braces
and attaching hardware, fittings and bolts

Crossarm Assembly

<u>Manufacturer</u>	<u>Crossarm Size</u> (inches)	<u>Catalog No.</u>
Hughes Brothers	$3\frac{1}{2}$ x $4\frac{1}{2}$ x 8'-0"	2890A
	$3\frac{3}{4}$ x $5\frac{3}{4}$ x 8'-0"	2890B
	$3\frac{3}{4}$ x $7\frac{3}{4}$ x 8'-0	2892-A
	$3\frac{3}{4}$ x $7\frac{3}{4}$ x 10'-0"	2892-B

Twin Arm Spacer*

To be used with standard hardware, 8' x $3\frac{5}{8}$ " x $4\frac{5}{8}$ " crossarm
and 28" wood braces

Flagg

PX240

*Restricted to applications where the conductor's maximum design
tension is less than 1250 lbs. and to conductor sizes 1/0 ACSR and
below.

gw-1

April 1981

gw - Crossarm Assembly for H-Frame Construction

Applicable Specification: REA Specification T-7, Revision dated November 1962

Applicable Drawing : TH-11B Series (161 kV maximum)
No braces (TH-11B)
Two vee braces on outside (TH-11BVO)
Two vee braces on inside (TH-11BVI)
Four vee braces (TH-11BV4)

3-5/8" x 9-3/8" x 33' wood crossarm assembly complete with attaching hardware, fittings, bolts and 3-3/8" x 5-3/8" braces.

Catalog Nos. or Drawing Nos.

	<u>TH-11B</u>	<u>TH-11BVO</u>	<u>TH-11BVI</u>	<u>TH-11BV4</u>
(Assemblies)	<u>Items</u> gw	<u>Items</u> gw and vo	<u>Items</u> gw and vi	<u>Items</u> gw and vv
American Crossarm and Conduit Co. (1)	70250	7025VO	7025VI	7025V4
Brooks Lumber (1,2)	6411	6411-1	6411-2	6411-3
Cascadian (1)	CCC11B72	CCC11B72-VO	CCC11B72-VI	CCC11B72-V4
Hughes Brothers (1,2)	C3316-B	C3316-B	C3316-B	C3316-B
United (Ky. AEC)(1)	SW16111-0	SW16111-VO	SW16111-VI	SW16111-V4

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

January 1981

gw - Crossarm Assembly for H-frame Construction
(Double Arm) 230 kV (Small Angle)

Applicable Specification: REA Specification T-8
Drawing : TH-231B

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 3-3/8"

<u>Manufacturer</u>	<u>Catalog No.</u>
American Crossarm & Conduit (1)	8026VB
Brooks (1)	64231
Cascadian (1)	CCC231B82
Hughes (1,2)	C-3338-B
Koppers (1)	REA-230B

Crossarm 5-1/8" x 7-1/2"

Hughes (1,2)	C-3338-BL
--------------	-----------

- 1 - Fixed spacer fitting sizes as required.
- 2 - Adjustable spacers are available.

gx-1
April 1981

gx - Single Pole Steel Structures with Arms

Applicable Specification: REA Specification for Single Pole Steel
Structures Complete with Arms, T-9

Manufacturer

Type

Bruce Lake

Single circuit,
delta conductor
arrangement - Type SCSUSP1
Single circuit
vertical conductor
arrangement - Type SCSUSP2
Double circuit conductor
arrangement - Type SCSUSP3
Single circuit, large angle
arrangement - Type SCHA4

Meyer

Single circuit,
delta conductor
arrangement - Type 1
Single circuit,
vertical conductor
arrangement - Type 2
Double circuit conductor
arrangement - Type 3
Single circuit, large angle
arrangement - Type 4

Union Metal

Single circuit,
delta conductor
arrangement - Type D
Single circuit,
vertical conductor
arrangement - Type E
Double circuit conductor
arrangement - Type H
Single circuit, large angle
arrangement - Type K

gx - Single Pole Steel Structures with Arms

Applicable Specification: REA Specification for Single Pole Steel
Structures Complete with Arms, T-9

Manufacturer

Type

C-E American

Single circuit,
delta conductor
arrangement - Type 1
Single circuit,
vertical conductor
arrangement - Type 2
Double circuit conductor
arrangement - Type 3
Single circuit, large angle
arrangement - Type 4

Muskogee Iron Works

Single circuit,
delta conductor
arrangement - Type SCD
Single circuit,
vertical conductor
arrangement - Type SCV
Double circuit conductor
arrangement - Type DC
Single circuit, large
angle arrangement - Type SCV

Power Enterprises, Inc.

Single circuit,
delta conductor
arrangement - Type 1
Single circuit,
vertical conductor
arrangement - Type 2
Double circuit conductor
arrangement - Type 3
Single circuit, large
angle arrangement - Type 4

gx-3
April 1981

gx - Single Pole Steel Structures with Arms

Applicable Specification: REA Specification for Single Pole Steel
Structures Complete with Arms, T-9

Manufacturer

Type

Anchor Metals

Single circuit delta
conductor arrangement - TUS-1
Single circuit, vertical
conductor arrangement - TUS-2
Double circuit conductor
arrangement - TUS-3
Single circuit, large angle
arrangement - TUS-4

Valmont Industries, Inc.

Single circuit delta
conductor arrangement S/C-DC
Single circuit, vertical
conductor arrangement S/C-VC
Double circuit conductor
arrangement D/C-SC
Single circuit, large
angle arrangement S/C-L/A

April 1981

**gy - Crossarm Assembly for H-frame Construction
(Double Arm)**

Applicable Specification: REA Specification T-7, Revision dated
November 29, 1962
Applicable Drawing : TH-10 Series
No braces (TH-10)
Two vee braces on outside (TH-10VO)
Two vee braces on inside (TH-10VI)
Four vee braces (TH-10V4)

3-5/8" x 9-3/8" x 32' wood crossarm assembly complete with
attaching hardware, fittings, bolts and 3-3/8" x 5-3/8"
braces.

Catalog Nos. or Drawing Nos.

	<u>TH-10</u>	<u>TH-10VO</u>	<u>TH-10VI</u>	<u>TH-10V4</u>
	<u>Items</u>	<u>Items</u>	<u>Items</u>	<u>Items</u>
(Assemblies)	gy	gy and vo	gy and vi	gy and vv
American Crossarm & Conduit Company (1)	70208	70228	702281	70248
Brooks Lumber (1,2)	6410	6410-1	6410-2	6410-3
Cascadian (1)	CCC1071	CCC1071-VO	CCC1071-VI	CCC1071-V4
Hughes Brothers (1,2)	C-3316-A	C-3316-A	C-3316-A	C-3316-A
Niedermeyer-Martin(1)	N-6710	N-6711	N-6712	N-6713
United (Ky. AEC) (1)	SW16110-0	SW16110-VO	SW16110-VI	SW16110-V4

1 - Fixed spacer fitting sizes as required

2 - Adjustable spacers are available

gy-2
April 1981

gy - Crossarm Assembly for H-frame Construction
(Double Arm) 230 kV (Tangent)

Applicable Specification: REA Specification T-8
Drawing : TH-230

Assembly complete with attaching hardware, fittings, bolts and braces.

Crossarm 3-5/8" x 3-3/8"

<u>Manufacturer</u>	<u>Catalog No.</u>
American Crossarm & Conduit (1)	8025V4
Brooks (1,2)	64230
Cascadian (1)	CCC23081
Hughes (1,2)	C-3338-A
Koppers (1)	REA-230S
Niedermeyer-Martin (1)	N-6720

Crossarm 5-1/8" x 7-1/2"

Hughes (1,2)	C-3338-AL
--------------	-----------

- 1 - Fixed spacer fitting sizes as required.
- 2 - Adjustable spacers are available.

gz - Crossarm Assembly for Wishbone Construction, "Z" Type
(Single Arm)

Applicable Specification: REA Specification T-5
Applicable Drawings : REA Drawings TSZ-1 and TMZ-1

3-5/8" x 5-5/8" wood crossarm assembly complete with
brace and attaching hardware, fittings, and bolts

The following manufacturers have shown compliance with the applicable
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	601TSZ and 602TSZ
Brooks Lumber	64Z1
Hughes Brothers	C-3162-A and C-3162.10

gz-2

April 1981

gz - Crossarm Assembly for Wishbone Construction, "Z" Type
(Double Arm)

Applicable Specification: REA Specification T-5

Applicable Drawings : REA Drawings TSZ-2 and TMZ-2

3-5/8" x 5-5/8" wood crossarm assembly complete with
brace and attaching hardware, fittings and bolts

The following manufacturers have shown compliance with the applicable
specifications for this assembly:

<u>Manufacturer</u>	<u>Catalog Nos. or Drawing Nos.</u>
American Crossarm & Conduit Co.	602TSZ
Brooks Lumber (2)	64Z2
Hughes Brothers	C-3162-B and C-3162.10

(2) Adjustable spacers are available.

sb - Switch, disconnect (single-pole, hook-operated
distribution class)*

For distribution line use where power class insulation is not required
and single-phase switching is permissible.

(Not suitable for substation use)

<u>Manufacturer</u>	<u>Type</u>	<u>Voltage Rating</u>	<u>System Voltage Line-to-Line</u>
ANIXTER Royal	BLT(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Chance	M3(PL)	15 and 27 kV	12.5 thru 24.9 kV
Gould-Brown Boveri (ITE)	DS(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
Kearney	D-73(PL)	15 and 23 kV	12.5, 13.2, 24.9 kV
McGraw-Edison	D2(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Morgan	DHS (PL included in 15 kV)	15 and 23 kV	12.5, 13.2, 24.9 kV
H. K. Porter	EV(PL)	15 kV	12.5 kV
S & C	LBD(PL)	15 and 25 kV	12.5, 13.2, 24.9 kV
Siemens-Allis	HD(PL)	15 and 25 kV	12.5 thru 24.9 kV

NOTE: Switches on this page must be furnished with four bolts for
double crossarm mounting.

(L) Means solid material load interrupters are available and accepted.

(PL) Means hooks for portable load interrupters are available.

(LV) Means vacuum interrupters are available and accepted.

*Steel bases only.

sc-1
July 1980

sc - Regulators, Voltage
12.5/7.2 kV
13.2/7.62 kV

Applicable Specification: REA "Specification for Substation Regulators,"
S-2

<u>Type</u>	<u>Size</u>	<u>Description</u>
<u>General Electric</u>		
ML-32	19.1 - 509 kVA	(SL) Single phase - step type
MLT	500 - 1000 kVA	(S) Three phase - step type
VML-32	500 - 833 kVA	(S) Single phase - vacuum step type
VMLT-32	1200 - 2800 kVA	(S) Three phase - vacuum step type
<u>McGraw-Edison</u>		
RSAA	19.1 - 500 kVA	(SL) Single phase - step type
RAB	50 amp.	(L) Single phase - step type (Auto-Booster)
<u>Siemens-Allis</u>		
JFR	38.1 - 667 kVA	(SL) Single phase - step type
LFR	50 amp.	(L) Single phase - step type
<u>Westinghouse</u>		
UTS, UTT	167 - 1000 kVA	(S) Three phase - step type

(L) Indicates line use
(S) Indicates substation use

sd - Current Transformers
Outdoor Types

<u>Manufacturer</u>	<u>.6 kV</u>	<u>15 kV</u>	<u>25 kV</u>	<u>34.5 kV</u>	<u>69 kV</u>
Associated Engineering	GT HA WEO	BB-15 LG-15	BB-25 LG-25 COF	LG-34.5 COF	
Astra	AA TFW AB AD				
Duncan	DCEW DCCW DCAB				
General Electric	JCR-O JCW-O JAK-O JAD-O	JKW-5 JCK-5	JKW-6 JKW-150 KG-150	JKW-7 JKW-200 KG-200	JKW-350 KG-350
Sangamo	B6 Type	SMC-150			
Westinghouse	CSF/CMS CMF CLC/CLE	CTOM-110 KOR-11	ACT-150 CCO-150	ACT-200	ACT-350

NOTE: The transformer types listed above are accepted in all standard ratios. Insulation class, voltages, ratios and other necessary information should be specified when ordering.

Conditional List

sd

October 1980

sd - Current Transformers
Outdoor Types

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Electromagnetic Ind.</u>		
Type IK-E, 46-69 kV	971 (7/15/71)	To obtain experience.
Type UMCT, 0.6 kV	981	
Type UCT, 0.6 kV	12/16/71	
Type C03-110, 15 kV	1076	
Type C03-150, 25 kV	10/30/75	
Type C03-200, 34.5 kV		

Underground Distribution Equipment

The realm of underground distribution has made quite significant advances in the past few years. Due to these advances and the increasing feasibility of underground rural distribution, most REA borrowers have placed some distribution equipment underground, are presently planning to, or are anticipating doing so in the future. If borrowers are to obtain reliable and economical underground systems, approved standards for construction and equipment must be observed.

Underground equipment considered suitable is being included in the "List of Materials Acceptable for Use on Systems of REA Electrification Borrowers." Specifications have been written and are available on much of this equipment. It must be realized that very little operating experience is available on this type equipment. Therefore, much of the underground equipment will be listed as "Conditional" until such experience is obtained that will warrant removing the "Conditional" listing. Listing of an item as "Conditional" does not mean that the item is inferior. Conditional means that service experience is desired so the item can be properly evaluated and demonstrates satisfactory performance before consideration for final acceptance.

Any comments or suggestions regarding the use or operation of the listed underground equipment will be welcome.

U ae - Surge Arresters, Distribution
for Underground System Pole Risers
(Lightning Arresters)

<u>Manufacturer</u>	<u>Arrester Class</u>	<u>Arrester Type</u>	<u>Ratings - kV</u>
General Electric	Distribution, heavy duty	Alugard	9, 10, 18
Joslyn	Distribution, normal duty	Q	9/10, 18
	Distribution, heavy duty	J	9/10, 18
	Intermediate*	RS	9, 10, 18
Kearney	Distribution, heavy duty	Unigap	9, 10, 18
McGraw-Edison	Distribution, normal duty	ES	9/10, 18
	Distribution, heavy duty	EL	9, 10, 18
	Intermediate	RP2	9/10, 18
Ohio Brass	Distribution, normal duty	DA-III	9/10, 18
	Distribution, heavy duty	DA-IV	9, 10, 18
	Intermediate	GP	18
Westinghouse	Distribution, normal duty	LV	9/10, 18
	Distribution, heavy duty	LVBB	9/10, 18
	Intermediate	IVL	9, 10, 18

*Has intermediate class arrester characteristics but does not have intermediate class venting capability.

NOTE: The arresters listed on this page may be used singly or in parallel, but must be applied in accordance with paragraph VI.A., in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

U ae - Arresters, Surge
(For underground system pole risers or pad-
mounted equipment)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>RTE</u>		
Metal oxide	1185	To obtain experience
M.O.V.E. 9 & 18 kV	4/24/80	
<u>General Electric</u>		
Metal oxide, Tranquell	1185	Same as above
UD 9, 10, 18 kV	4/24/80	
Metal oxide, Tranquell	1197	
Intermediate class	10/9/80	
9, 10, 18 kV		

U an - Transformers, distribution
pad-mounted, dead-front

(For underground application)

Applicable Specifications: "REA Specifications for Pad-Mounted
Transformers," U-5

<u>Manufacturer</u>	<u>Single Phase</u>	<u>Three-Phase</u>
Central Moloney (2,4)	"REA-LP" 25-167 kVA	
Chance (2)	"Turf Hugger-R" 15-167-kVA	"Turf Hugger-R" 75-500 kVA
Dowzer (3,4)	"METRI-PAD" 25-167 kVA	"PM3W-R" 75-500 kVA
ERMCO (1) (4,6) (2,4)	"Trimline" 10-50 kVA "Low-Profile" 10-50 kVA "Low-Profile" 75 kVA	
General Electric (2,4)	"Mini-Pad III - REA" 10-167 kVA	"Compad II - REA" 75-2500 kVA
Howard (2,4)	"HiPad REA" 10-167 kVA	"HiPad 3 REA" 45-2500 kVA
Kuhlman (2,4)	"Lo-Pak ALR" 25-167 kVA	
McGraw-Edison (2,4)	Series 20/30 REA 25-167 kVA	"REA Pad-Mount" 75-2500 kVA
NECO (2)	HMM-R, 10-50 kVA SP-R, 75-167 kVA	TP-R, 45-1000 kVA
H. K. Porter (2,4) (Delta-Star)	"Low Profile U 5-R" 25-167 kVA	"Porter U5-R3" 225-2500 kVA
RTE (2,4)	"REA Shrubline" 15-167 kVA	"REA Terra-Tran" 45-2500 kVA
Standard (3,4,5)		"Mini-Pad RE010" 75-300 kVA "Stan-Pad RE010" 500-1500 kVA
United (Ky. AEC) (2,4)	"Pad-Mount" 15-75 kVA	

- (1) 7.2/12.5 and 7.6/13.2 kV
- (2) 7.2/12.5, 7.6/13.2 and 14.4/24.9 kV
- (3) 7.2/12.5 and 7.6/13.2 kV (conditional listing for 14.4/24.9 kV)
- (4) Dual voltage - same as for 14.4/24.9 kV, single phase
- (5) Three-phase listing applies to 7.2/12.5 and 7.6/13.2 kV only
- (6) 14.4/24.9 kV

July 1980

U an - Transformers, Distribution,
Direct Burial*

(5-25 kVA only)

Conditions: To obtain experience.

ManufacturerMetallic Tank
(Cathodic protection
required)Nonmetallic Tank
(Cathodic protection not
used)Central Moloney
(Meeting 993, 6/8/72)"Trenchmite" 15-25 kVA
Radial Feed or Loop Feed
(same end) only

-

Sargent-Tyee
(Meeting 1016, 5/10/73)

-

"No-Korrod"
10-25 kVA

*Direct burial transformers are at an early stage in their development. Large numbers of direct burial transformers should not be purchased from any one manufacturer by any one borrower in any one year. Carefull location records should be kept.

U ax
April 1981

U ax - Cutout and Arrester, Combination
for Underground System Pole Risers

Nominal System Voltage	For 12.5Y/ 7.2 kV		For 13.2Y/ 7.6 kV	For 24.9Y/ 14.4 kV
Cutout Maximum Voltage Rating	7.8 kV	15 kV	15 kV	27 kV
	1Ø	3Ø	1Ø and 3Ø	1Ø and 3Ø
Application	Risers	Risers	Risers	Risers
Cutout Current Rating	100 amps	100 amps	100 amps	100 amps
<u>Manufacturer</u>	<u>Catalog Numbers</u>			
Chance	C70J-2B64 Series	C70J-2F54 Series	C70J-2F54 Series	C70J-2L74 Series
General Electric	9F80	9F80	9F80	
Joslyn	J9237-P2	J9237-P2/R	J9237-P2-R	J9267-D2
McGraw-Edison	AFS300B Series	AFS300C Series	AFS300C Series	AFS301D Series
Southern States	CA Series	CA Series	CA Series	CA Series
Westinghouse	7.8LBU-II/ 10 LV	15LBU-II/ 10 LV	15LBU-II/ 10 LV	24.9LBU-II/ 18 LV

NOTE: The units listed on this page may be used with single arresters or arresters in parallel, but must be applied in accordance with paragraph VI.A. in REA Bulletin 61-3, "Underground Rural Distribution." Other arresters listed on pages ae-1 and ae-2 may be used for underground systems when applied in accordance with this bulletin.

Cutouts used on underground riser poles should be loadbreak type or have hooks for portable load interrupters.

Either normal duty or heavy duty distribution class arresters listed on page ae-1 are acceptable for use with these combination units.

U cg - Switch, air, three-pole, group-operated
for pole-mounted cable risers
(Factory Preassembled)

<u>Manufacturer</u>	<u>Mounting</u>	<u>Vertical Break</u>		<u>Side Break</u>	
		<u>Type</u>	<u>kV</u>	<u>Type</u>	<u>kV</u>
Chance	Vertical			D4,D5(L)15-27	
	Horizontal			D4,D5(L)15-27	
S & C	Vertical			Alduti(L)15-25	
	Horizontal			Alduti(L)15-25	
Westinghouse	Vertical	LB3-VR(L)15			

(L) Means gas or solid material full-load interrupters are accepted and available.

NOTE: Switches with factory-assembled crossarm type bases must have nonconducting crossarm type bases, nonconducting braces, and insulated interphase and control rods.

U fw
April 1981

U fw - Secondary Tap Connector

Manufacturer

Type or Catalog No.

Fargo

GUR-75 (10 amp max. load)
GUR-750 (10 amp max. load)

Raychem

Compression Connectors

CTE-300-00

CTE-400-00

CTE-500-00

Standard Split Bolt

CTE-300-00

CTE-400-00

U fz - Transformer Connector Block, Insulated

Multiple Cable Connectors

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Alcoa	Lug	Interchange 1 ABBD Series (Disconnectable) Use with A9 insulating boots
Alcon	Set Screw	VBTT Series with double sealing sleeve
Burndy	Lug	Stud Mole
Electrical Spec. Prod.	Lug	Type SU (Permanent)
	Lug	Types SUR and RDSR (Removable) (With Types LA and A1 lugs and sleeve kits)
	Set Screw	Type SUB (Permanent)
	Set Screw	Type SUBR (Removable) (Use with sleeves)
Fargo	Bolted	GUC Series
	Set Screw	GUS-200S Series
Homac	Lug	DF Series
	Lug	FTU 125 Series (Disconnectable) with flood seal sleeve kit
	Set Screw	UT-R Series
ITT	Lug	SCU, with lugs and sleeves
	Set Screw	TSB-J58C (Permanent)
	Set Screw	TSB-D58C (Disconnectable)
Penn Union	Lug	Type DBAT-LH (Disconnectable) Use with Series DBTB, DBTBF and DBTH lug and sleeve kits
	Lug	
Reliable	Set Screw	15912-REA (Disconnectable)
RTE	Set Screw	Uni-Joint (Disconnectable)
	Set Screw	Uni-Joint (Permanent)
Utilco	Set Screw	PTF-IN (Permanent)
		PTF-IN-J (Disconnectable)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

U fz-2
July 1980

U fz - Transformer Connector Block, Insulated

Single Cable Connectors

Manufacturer

Catalog Number

Electrical Spec. Prod

Type SM transformer bushing
connector kit. (Stud to
aluminum cables through
350 kcmil)

NOTE: Additional insulation may be required with some of the above-listed secondary terminal blocks due to the irregularity of mating surfaces between various secondary studs being supplied by the transformer manufacturers.

April 1981

U gn - Enclosures, Equipment

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Sectionalizing Enclosures</u>		
<u>Ranger</u> TE-501, TE-503, J-34-TB	1165(6/7/79)	To obtain experience.
<u>Kearney</u> CTC 653-0033	1177(11/29/79)	To obtain experience.
<u>RTE</u> SectER Series 400L (1Ø) SectER Series 450L (3Ø)	1186(5/8/80)	To obtain experience.
<u>Highline</u> HL80P-15(15 kV) HL81P-15(15 kV) HL90P (15 kV)	1204 1/22/81	To obtain experience.
<u>Burial Type</u>		
<u>Sonoco Products Co.</u> 36" Duropipe (fiber) transformer vault. Available with stainless steel clevises, angle or tab ring, protective shields and cast iron or welded steel grates.	836 3/10/66	To obtain experience.

U go
April 1981

U go - Fault Indicator
(For Construction Unit UM6-4)

Manufacturer

Type

Dossert

FLO-40

Edison Control Corp.

Series EC-100

Fisher Pierce

Series 1514
(To be used on single-phase
circuits only)

McGraw-Edison

Linam

RTE

TPR, LV, MR

U gp - Connector Blocks and Splices, Secondary

Watertight - For Use In All Locations

<u>Manufacturer</u>	<u>Connection Type</u>	<u>Catalog Number</u>
Alcoa	Lug	Interchange-I ABB Series Use with A-9 insulating boots
Alcon	Set Screw	VPB Series
AMP	Compression	600 Volts secondary UG Distribution 4-way and 6-way bus system
Blackburn	Lug Set Screw	Series UP (with lugs and sleeves) Series UB (1000 amp bus with sleeves)
Burndy	Lug	URD Mole
Electrical Spec. Prod.	Lug Set Screw	Type UC (8 AWG - 500 kcmil) (with LA lug and sleeve) Type UB (with sleeve) Splice Type ACL-HSH (6AWG - 500 kcmil)
Fargo	Set Screw	GU-500 Series
Homac	Lug Lug Set Screw	FS-95 Series with flood seal sleeve kit (8 AWG - 350 kcmil) FS-125 Series with flood seal sleeve kit (350 - 500 kcmil) UH-R Series
Kearney	Compression Compression	HCR HAR
Penn Union	Lug	DBA Series with DBTB, DBTBF and DBTH Series lug and sleeve kits
Reliable	Set Screw	15903-15908, 15910 with sleeve kit (4 AWG - 350 kcmil) 15911 with sleeve kit (500 - 750 kcmil)
RTE	Compression	Aqua Guard Splice Kit
Utilco	Set Screw	Safety Sub Splice - USPA-350SS

Non-Watertight - For Use in Above-Grade Pedestals Only

Fargo	Set Screw	GUS-200 Series
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U gq
July 1980

U gq - Boot or sleeve, insulated*

Manufacturer

ITT Blackburn

Catalog Number

MPC9
MPC15

Electrical Materials

100-B (for pad-mounted
transformer spade
terminals)

*Use restricted to 120/208 volt 500 kVA transformers and larger not
equipped with threaded studs.

Conditional List
U gu(2)
April 1981

U gu - Power Pedestal
Refer to Drawings UK6 and UM5-5

Applicable Specifications: "REA Specifications for Secondary Power
Pedestals," U-6

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Dexol</u>		
HDPE, DX-101	1140	To obtain experience.
DX-102	6/1/78	
ABS, DX-101HD		
DX-102HD		
 <u>Highline</u>		
HL50AE	1204	To obtain experience.
HL51	1/22/81	

U gv
July 1980

U gv - Stake, Power Pedestal
Refer to Construction Drawing UK5

<u>Manufacturer</u>	<u>Length Inches</u>	<u>Catalog No.</u>	
		<u>For Power Pedestal Only</u>	<u>For Joint Pedestal</u>
Fargo	42-60-72-78	UP-530S Series	UP-530J Series
Nordic	48-60-72	PM Series	
Utility Prod.	72-78-84	DM Series	DM Series

April 1981

U hb - Cable Accessories

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)200 Ampere Continuous Current Rating

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>ITT Blackburn</u>		
15 kV, used with		To obtain experience.
loadbreak connectors		
Type LB2BA bushing plug		
Type ABOC insulating cap	1012 (3/15/73)	
Type JLB2BA bushing plug*		
25 kV, used with non-	1042 (5/30/74)	
loadbreak connectors		
Type LB2CA bushing plug	1110 (3/17/77)	
Type ABOCC insulating cap	1193(8/21/80)	
 <u>Elastimold (ESNA)</u>		
15 kV, used with		
loadbreak connectors		To obtain experience.
Style 1601-CL cable lead	921 (6/26/69)	
Style 1602A3R feedthru insert*	1171	
Style 1601-A3R bushing plug*	9/6/79	
Style 160-DR insulating cap	924 (8/7/69)	
Style 1601CIBA3R	1174 (10/18/79)	
15 kV, used with non-loadbreak		
connectors	921	
Style 1501-A1 bushing plug	6/26/69	
Style 150-DP deadend plug	842	
Style 150-DR deadend receptacle	6/2/66	
25 kV, used with loadbreak		
connectors	964	
Style 2701-A1 bushing plug*	4/8/71	
25 kV, used with non-loadbreak		
connectors	921	
Style K-1501-A1 bushing plug	6/26/69	
Style K-150-DR deadend receptacle	945 (6/11/70)	
25 kV used with loadbreak connectors	1199	
Style 270-DR deadend receptacle	11/6/80	

*Note: Asterisk indicates single or three phase. Other bushing plugs for
use with loadbreak connectors are single phase only.

Conditional List
U hb(1.1)
July 1980

U hb - Cable Accessoties

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u>		
15 kV, used with loadbreak connectors		To obtain experience
Switch module 9U02AAA001	930(10/30/69)	
Switch module 9U02AAB001*	1133(2/16/78)	
Basic connector module 9U05 Series	930(10/30/69)	
25 kV, used with loadbreak connector		
Switch module 9U02BAA001	1016(5/10/73)	
Switch module 9U02BAB001*	1133(2/16/78)	
Insulating cap 9U01BEB001	1016(5/10/73)	
 <u>RTE</u>		
15 kV, used with loadbreak connectors		To obtain experience
No. 2603711A12 protective cap	1033(1/17/74)	
No. 2604797B01 bushing well insert*	1126(11/3/77)	
No. 2625194A01 two-way bushing well insert*		
No. 2604231B01 bushing well plug		
25 kV, used with loadbreak connectors		
No. 2606591A02 protective cap	1033(1/17/74)	
No. 2604982B01M bushing well insert*	1148(9/28/78)	
No. 2604975B01M two-way bushing well insert*		
35 kV, used with loadbreak connectors		
No. 2606630A01 protective cap	1048(8/22/74)	

*NOTE: Asterisk indicates single or three phase. Other bushing plugs for use
with loadbreak connectors are single phase only.

U hp - Terminations, Elbow*

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>Burndy</u>		
15 kV, Loadbreak		
LBT 112 (without test point)	1144	To obtain experience.
LBT 112-T (with test point)	8/3/78	
<u>Elastimold (ESNA)</u>		
15 kV	945	To obtain experience.
Style 154-LR (non-loadbreak with voltage test point)	6/11/70	
Style 163-LR (Loadbreak without voltage test point)		
Style 164-LR (Loadbreak with voltage test point)		
25 kV	945	
Style K-154-LR (non-loadbreak with voltage test point)	6/11/70	
Style 271-LR (Loadbreak without voltage test point)	1068	
Style 272-LR (Loadbreak with voltage test point)	6/26/75	
35 kV		
Style 354-LR (non-loadbreak with voltage test point)	1064 5/1/75	

*NOTE: Non-loadbreak devices require that connections be made in non-energized conditions only.

For application of loadbreak elbows on three-phase systems, refer to
REA Bulletin 61-15 dated June 1974.

Conditional List

U hp(2)

July 1980

U hp - Terminations, Elbow*

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>General Electric</u>		
15 kV, Loadbreak	930	To obtain experience.
Elbow connector module	10/30/69	
9U01 Series		
25 kV	1016	
9U01BAA Series (Loadbreak with voltage test point)	5/10/73	
9U01BBA Series (Loadbreak without voltage test point)		
<u>ITT Blackburn</u>		
15 kV, Loadbreak	981(12/16/71)	To obtain experience.
T2B (without test point)		
T2BT (with test point)	981(12/16/71)	
15 kV, Non-loadbreak	1037	
TN2BT (with test point)	3/21/74	
25 kV, Non-loadbreak		
T2CT (with test point)		
TN2CT (with test point)		

*NOTE: Non-loadbreak devices require that connections be made in non-energized conditions only.

For application of loadbreak elbows on three-phase systems, refer to
REA Bulletin 61-15 dated June 1974.

U hx
July 1980

U hx - Cable Route Marker

Manufacturer

Catalog No.

Surface Mounted

Chance

C554-0001

Fargo

GM354

Above Grade

Chance

C554-0183

Dun-Lap

DL-R45
DL-R712

Lyle

UM12-712

May Advertising

MY45A
MY712A

For pressure sensitive decal add "D" prefix to catalog number.

Truck Sign Service

BCW-712

Conditional List
U hy(1)
April 1981

U hy - Splice, Underground, Permanent

(When ordering specify conductor size, type, whether
copper or aluminum and insulation diameter)

<u>Manufacturer</u>	<u>Meeting No. and Date</u>	<u>Conditions</u>
<u>AMP</u> "Ampact Splice" (35 kV)	1126(11/3/77)	To obtain experience
<u>Burndy</u> Type PMS162 (15 kV)	981(12/16/71) 1207(3/5/81)	To obtain experience
<u>Elastimold (ESNA)</u> Style 1500S, straight splice, through #1/0 (15 kV)	1135(3/23/78)	To obtain experience
Style 25-S, straight splice, #2/0 through #4/0 (15 kV)	1135(3/23/78) 873(7/27/67)	
Style 25-Y, Y-splice (15 kV)	921(6/26/69)	
Style K-25-S, straight splice (25 kV)		
Style K-25-Y, Y-splice (25 kV)		
Style M-250-S, straight splice (35 kV)	1134(3/2/78)	
<u>General Electric</u> "Uni-Matic" (15 & 25 kV) (max. cable size 2/0)	977 10/14/71	To obtain experience
<u>ITT Blackburn</u> Type S4B (15 kV) Type S4C (25 kV)	1160 3/29/79	To obtain experience
<u>3M</u> "Quick Splice II" 5411, 5412 (15 kV) (#2 Awg thru #4/0 Awg)	1194(9/4/80)	To obtain experience
"Quick Splice" 5400 series (15 kV) (250 kcmil thru 750)	969(6/17/71) 1024(8/30/73) 1032(12/20/73)	
5420 series (25 kV)		

WATTMETERS, RECORDING

	<u>Meeting No. and Date</u>	<u>Conditions</u>
General Electric	851 10/13/66	To obtain operating experience.
	<u>Type</u> <u>Description</u>	<u>Group*</u>
	CH-11 3 ϕ watt-var recorder, ink or inkless, portable, motor or clock	II
	CF-11 3 ϕ watt-var recorder, inkless, portable, motor	IV

*Refer to Part III - General Plant Items for explanation of groups.

WATTHOUR METER TEST SETS
AND ROTATING STANDARDS

	<u>Instrument</u>	<u>Type or Model</u>	<u>Group*</u>
Eastern Specialty	Current transformer field test kit	1012	II
	Meter test board	990A	I
	Meter test kit	G-50	II
General Electric	Portable standard	IB-10	II
Knopp, Inc.	Loading transformer	CL-6	II
	Watthour meter testing equipment	TE-14	I
Sangamo	Portable standard	J-33	II
		J-44	II
States Company	Watthour meter test table	HAPBL	I
	Photoelectric watthour meter tester	150	I
	Meter test kit	KFLD	II
	Demand meter test table	FDM	I

* Refer to "Part III - General Plant Items" for explanation of groups.

U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C.

JUL 13 '81

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